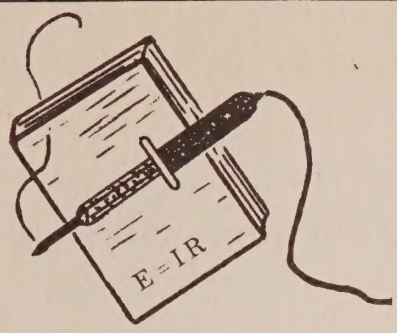
7100



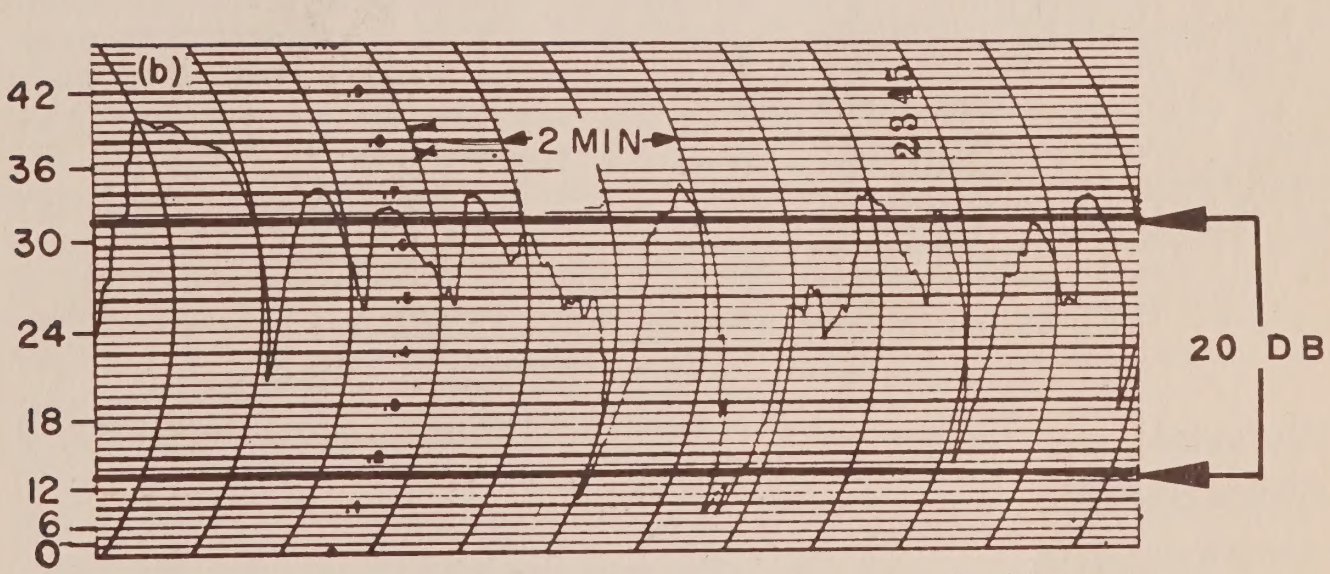
VHFER

LEARN BY DOING

50 MC. AND UP

Volume 3, No. 8 August, 1965

400 MC. TROPOSPHERIC SCATTER FADING



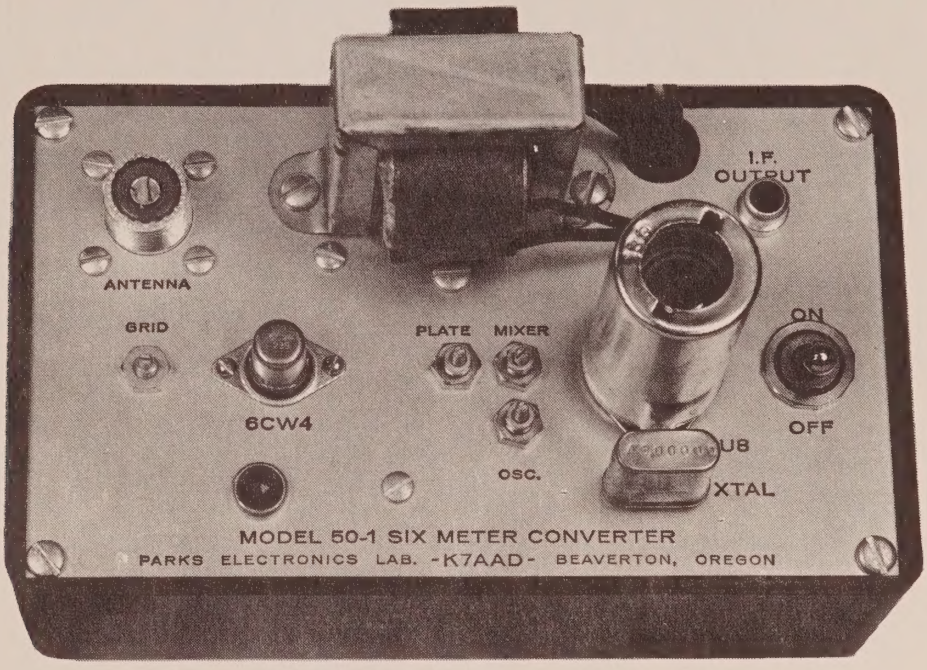
SPACE DIVERSITY RECEPTION

A GOOD SIX METER CONVERTER

MODEL 50-1

$38.00 postpaid--new price as of Sept. 15

$34.50 (old price) on all orders postmarked no later than Sept. 15.

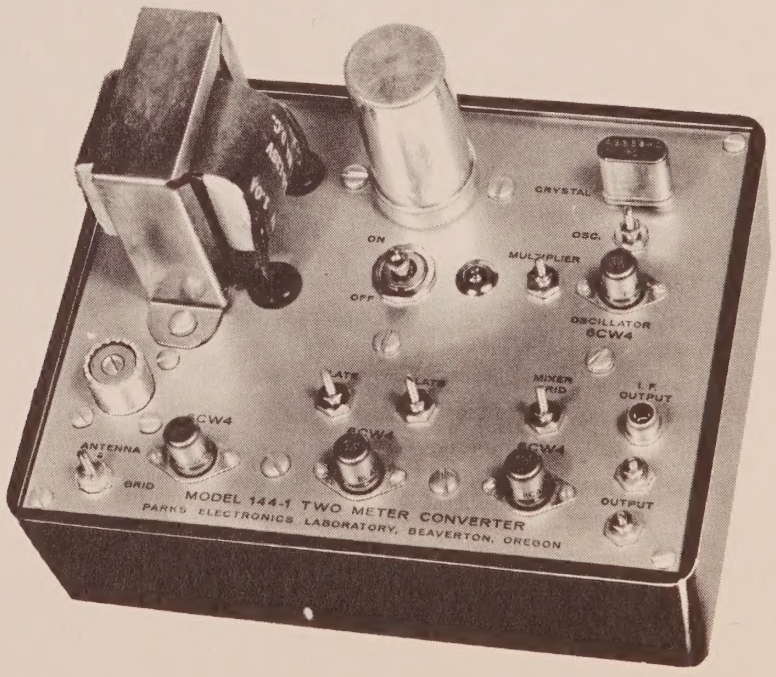


This is the first amateur product we ever made. Hundreds are in use. Noise figure of 2.5 d.b. or less with plenty of gain to override the noise of your communications receiver. Choose your I.F.: 7, 10, 14, 22, 26, 27, 28 or 30.5 megacycles. Choice of UHF (shown) or BNC input connector, phono or BNC output connector. Bandwidth about 1.5 Mc. Neutralized triode front end (6CW4), 6U8 mixer-osc. Self-contained power supply. Send check or money order to Parks Electronics Lab., Rt. 2, Beaverton, Oregon. Add 35¢ for Special Handling (same speed as first class letter.)

Nuvistor
CONVERTER

$54.95 postpaid

- Noise Figure less than 3 d.b. over full 4 Mc. Bandwidth.
- Any I.F. from 7 to 50 Mc.



PARKS ELECTRONICS LABORATORY

ROUTE 2, BOX 35 • BEAVERTON, OREGON

LETS TALK ABOUT MOONBOUNCE
by Loren Parks, K7AAD

From the mail I get and what I hear on our 75 meter VHF net it is pretty evident that interest in moonbounce is snowballing. Of course not a large number of hams have the inclination, space and ability to go this route. But those hams who do will get full co-operation here. We aren't oriented toward gooney box operation. I would like to be able to give you a listing of all stations who have heard their own echos via the moon, but I only know of 6 or 7. I'm sure there are many more. If I had such a listing I wud publish it so everyone would know who has what and they could get together for skeds. If you have such information, whether you did the m.b. or not, please send it in and I will badger the proper person for information on equipment and frequencies plus any other secrets he may have to ferret out signals from white noise. Here are a few calls of successful stations. 2 meters: W6DNG, OH1NL, UA1DZ (Russia), KP4BPZ. 432: KP4BPZ, W1BU, W3SDZ, WA6LET, KH6UK. 1296: W1BU and the Eimac group. Surely there are many more. Who are they? If you know some, please write.

It has been against VHFER policy to put in stuff about who is building what because a high percentage of those projects never get beyond the talking stage. I will make an exception here to show you how many hams are sporting dishes in their back yards and getting ready for moonbounce. Here are some I know of: W6NLZ (15 ft parabola), K6KV (15 ft parabola), Herb Gordon in Harvard, Mass. with a 24 ft. parabola going up (I think the size is right), W4HHK with a 15 ft? parabola (see recent QST cover), WØIKQ (15 ft), W1BU (30 ft parabola) and K7AAD with a 40 ft. orange peel.

How do you get a dish? Most are bought at junk yards or from surplus houses, maybe thru MARS. Sometimes the dish is cheap but carting it is very expensive. Sam Harris' 30 ft parabola came from a junk yard for $200. A friend of his ran across it and told him about it. What a bargain that was. Some hams make their own dishes. Perhaps we can get more info. on techniques. A back issue of 6 up showed how to do it but we don't have any copies of that issue. You sure don't have to have a dish to do moonbounce. Most moonbouncers have used Yagis or colinears. But you have to know what you're doing. Count me among those scared silly of the phasing problems on a big array at 432, or even two meters. I can figure it like anyone else but the mechanics and electronics of proving proper phasing experimentally is another matter. That's why I jumped at the chance to use the big orange peel. I have almost 6 acres. The orange peel is bright orange. My neighbors are not happy. Neither is my wife.

MOONBOUNCE TESTS COMING UP

Moonbounce tests will begin at 1430 GMT and last thru 2400 GMT utilizing the 150 ft. dish of Stanford University operating under the call WA6LET. Frequency will be 432.000. They will use right-hand circular polarization. A 1 d.b. noise figure parametric amplifier will be used for receiving. One goal is to work VK3ATN in Australia, but they will of course also work anyone else they can hear. It is estimated that only a few stations will have sufficient power and antenna to make the grade. Date is Sept. 25. If you wish to write about skeds you may contact Ken Holladay, K6HCP, 7733 Rainbow Drive, San Jose, Calif. Send self-addressed, stamped envelope.

VHFER magazine is published monthly by Parks Electronics Lab., Rt. 2, Box 35, Beaverton, Ore. 97005. Subscription rates: U.S. & possessions, $2 per year. Others, $3 per year. Second class postage paid at Beaverton, Oregon.

A HIGH-SENSITIVITY VHF FIELD STRENGTH METER

by Rod Rigg, W6YGZ*

A good field strength meter is a very handy instrument for tuning transmitters and antennas. Simple field strength meters that use just a diode, meter and a dipole have their place, but a higher sensitivity unit certainly has more applications. Now that good transistors and diodes are available for under a dollar, a complete high-sensitivity field strength meter can be built for just a few dollars including the price of the meter.

The unit to be described is very simple and easy to adjust. It consists of a tuned circuit, a diode rectivier and a silicon transistor amplifier driving a 0-1 ma. meter. Almost any germanium diode and NPN silicon transistor will do the job. While a germanium transistor could be used, it won't have the temperature stability and leakage characteristics of the silicon unit. If you use a PNP transistor you will have to reverse the polarity of the diode, battery and the meter. The circuit is shown in Fig. 1 below.

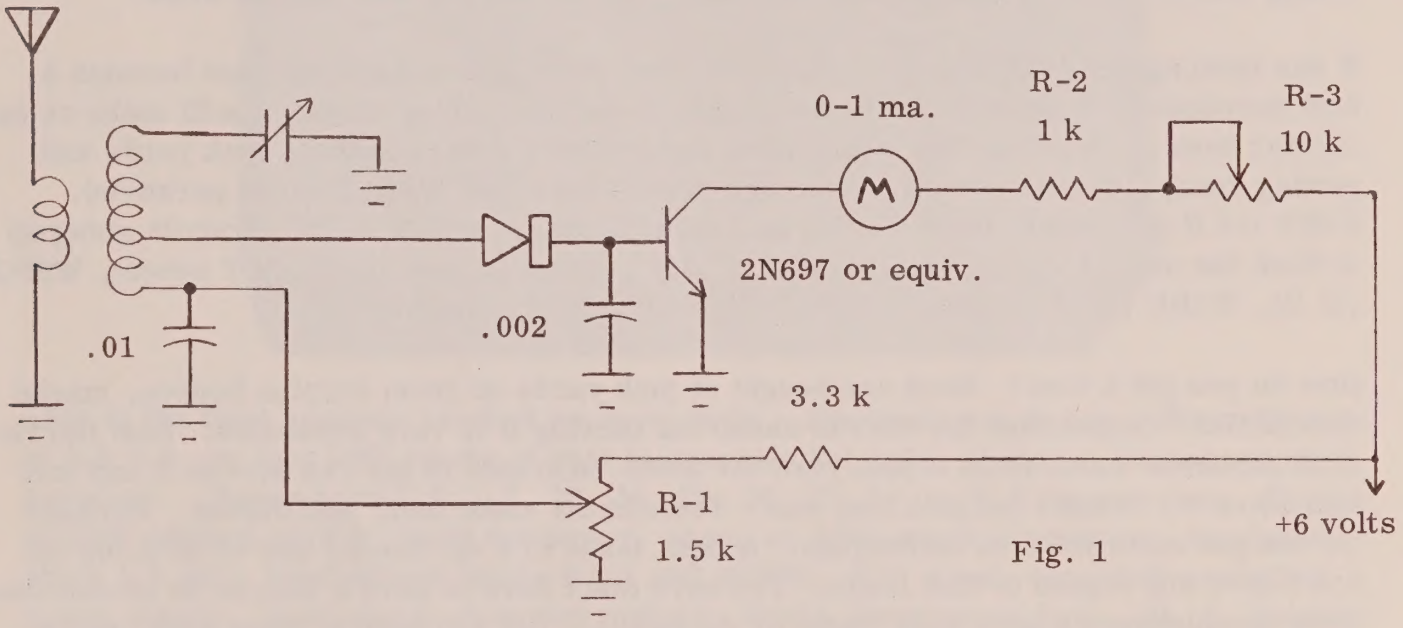


Fig. 1

The tuned circuit you use will of course depend on the band you want to use. A grid dip meter can be used to set up the range of frequencies to be tuned. You may connect the diode to the top of the coil if you want broader tuning, but sharper tuning can be achieved with very little apparent loss of signal by tapping down on the coil for the diode take-off point. If the diode is connected backward it will reverse bias the base of the transistor by applying a negative voltage to the base when signal is applied. This will cut off or reduce current flow through the transistor and the meter with signal.

R1 is adjusted only once in a great while so it can be left inside the case. Initial adjustment simply involves turning R1 until the meter reads about .05 to .1 ma. with no r.f. signal applied. R2 is a current-limiting resistor for protection. R3 is a sensitivity control of sorts. Minimum resistance will produce maximum sensitivity. If you adjust the pot (R3) so that no more than 1 ma. flows with maximum signal it can be left in this position for most applications. Increasing the resistance of R3 more will decrease the sensitivity and will also reduce the maximum reading of the meter.

The transistor used here was an RCA 2N697 and it turned out to be very stable. The current price on the 697 is about 81¢ and it has a gain-bandwidth product of 100. Watch the insulation because the case of the 2N697 is connected to the collector for cooling purposes.

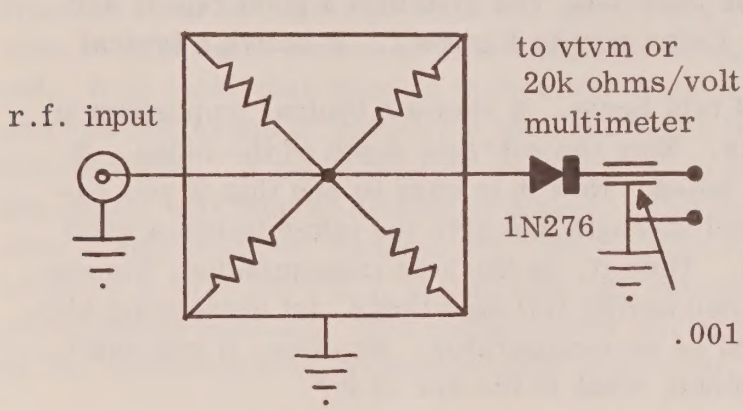
*1305 Occidental, Stockton, Calif.

A HOMEMADE R.F. WATTMETER

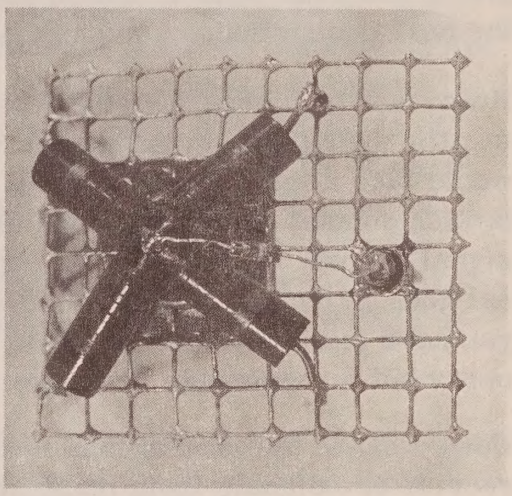
by Frederick W. Brown, W6HPH *

This is a little gadget that I've found to be darn near indispensable for experimental work on low-power transmitters and exciters. It doesn't measure r.f. power with 1% precision, but it certainly is a vast improvement over the light bulb method. If built and used carefully the accuracy is comparable to the lower-priced (less than $200) laboratory type instruments, most of which work on the same principle.

Essentially this wattmeter is simply a dummy load and diode rectifier which permits measurement of r.f. voltage across the load with a d.c. voltmeter. Application of the E^2/R power relation gives the r.f. power being dissipated in the load. The configuration of four 220-ohm, 2 watt resistors is an excellent match to 50-ohm coax on all bands through 1296 Mc. The resistors will dissipate 8 watts continuously and up to 20 watts for brief periods.



all resistors 220 ohm, 2 watt composition



If the detector responded to peak voltage and had a rectification efficiency of 100%, the E^2/R formula would have to be multiplied by 1/2 since the formula assumes r.m.s. voltage. For a 50-ohm load the formula would then be $P=.01\ E^2$ watts, E being the voltmeter reading. If the rectification efficiency were 70.7% the meter would read r.m.s. voltage directly and the formula would be $P=.02\ E^2$ watts. The actual measured rectification efficiency lies between 70 and 100 percent, and the best formula for amateur bands below 300 Mc. turns out to be Power in Watts = $.013\ E^2$.

There are two limitations to this type of instrument that should be kept in mind. One is the fact that for voltages below 1/4 volt (which is less than a milliwatt of power) the detector will begin to get square law and readings will be low. The useful range of the instrument is therefore about a milliwatt to 8 watts continuous or 20 watts briefly.

The other thing to remember is that this is a peak-reading device that effectively adds voltages instead of powers. If more than one frequency is present the reading will be way high. So make sure your exciter has no parasitics or harmonics in the output. It is very easy to measure more than 100% efficiency with varactor multipliers unless you are very careful to suppress completely the wrong harmonics.

Construction is simple and self-evident from the photograph and diagram. The device is also useful as a matched detector for antenna measurements (see June VHFER.) End.

*Pine Cove, Idyllwild, Calif.

SPACE DIVERSITY FOR IMPROVED RECEPTION

by John Chambers, W6NLZ*

A definition of the term "diversity" is the use of more than one receiver or antenna, or the combination thereof, in a manner to minimize the undesirable effects of fading of radio communications. The use of space diversity is far from new. In the 1937 copy of Terman's Radio Engineering, on page 587, there is a discourse on the advantages of diversity reception. It gives references to the Proceedings of the IRE, Volume 19, dated April 1931, where Mr. H.H. Beverage and Mr. H.O. Peterson describe the receiving systems of RCA communications for radio telegraphy.

Why diversity? In the main, it goes back to the nature of signals which we are trying to receive. They fade. And worse than that, they fade just when you are trying to hear what the other fellow is saying. True, many of the normal ionospherically propagated signals (h.f. bands 3-30 Mc.) are pretty good, but when trying to work either tropospheric or ionospheric scatter or just weak distant stations, about the time the other fellow is giving you your report, out he goes. Worse than that, you give him a good report and the next transmission you can't hear him. Refer now to Figure 1. It shows a typical

Refer now to Figure 1 on the front cover of this issue. It shows a typical tropospheric scatter signal and its fading characteristics. Note the extreme depth of the fades. It would take a lot of brute force to fill those holes. Now it is easy to see that if you establish contact during apperiod of high signal strength and give the other fellow a good signal report, he will assume copy is good. Then if, on the next transmission, his signal goes into one of the deep nulls and you can hardly tell he's there, let alone copy him, you have just classified yourself in his mind as an exaggerator. Besides, if you can't carry out a reasonable exchange of intelligence, what is the use of it?

Now, what is the mechanism of this fading? Nearly all of the weak signals amateurs receive are signals from many sources. That is, the signal that originated from, say, India on 20 meters has taken several ionospheric bounces to get here; usually not in a clean and clear-cut three or four bounces, but a mixture of two or more paths along, and sometimes completely around the earth's surface. This energy arrives at the receiving antenna in varying phase and amplitude relationships. If it is exactly in phase, the signal is good. It peaks up. If the energy is out of phase (and this often happens), and the two sources are exactly 180 degrees out of phase and are of almost equal amplitude, the signal is gone and it stays gone while this relationship exists, often as long as several seconds. Interestingly enough, if two receivers a few wavelengths or so apart are tuned to the same signal, the fading characteristic of Signal A and Signal B will be different. Space diversity systems are and have been commonly employed for h.f. commercial radio communications for a very long time. Amateurs in general do not have sufficient real estate for a practical space diversity antenna setup for the h.f. bands. This is a good place to point out that cross polarization diversity works very well on h.f. with almost no physical spacing, but has very limited application to UHF and VHF circuits with the exception of sporadic "E", meteor scatter and "F" layer reflection, when we get it.

A few words are in order about polarization diversity on VHF and UHF. It is used very extensively in commercial circuits. It normally consists of two sets of antennas at each end of the circuit, usually one set horizontal and one set vertical. They are not cross-polarized as would be commonly employed on h.f., but horizontal to horizontal and vertical to vertical. The cross-polarization content is very small, but interestingly enough the fading characteristics are substantially different as compared between the horizontal and the vertical. By splitting the transmitter output power between the horizontal and the vertical, the equipment at the transmitted end is relatively simple. The receiving end requires two antennas and either antenna switching or two receivers. Normally on

2228 Via La Brea, Palos Verdes Estates, Calif.

scatter circuits quadruple diversity (both polarization and frequency diversity) are employed to yield a remarkable degree of consistency. Figure 2 shows the typical improvement that can be expected from properly used quadruple diversity.

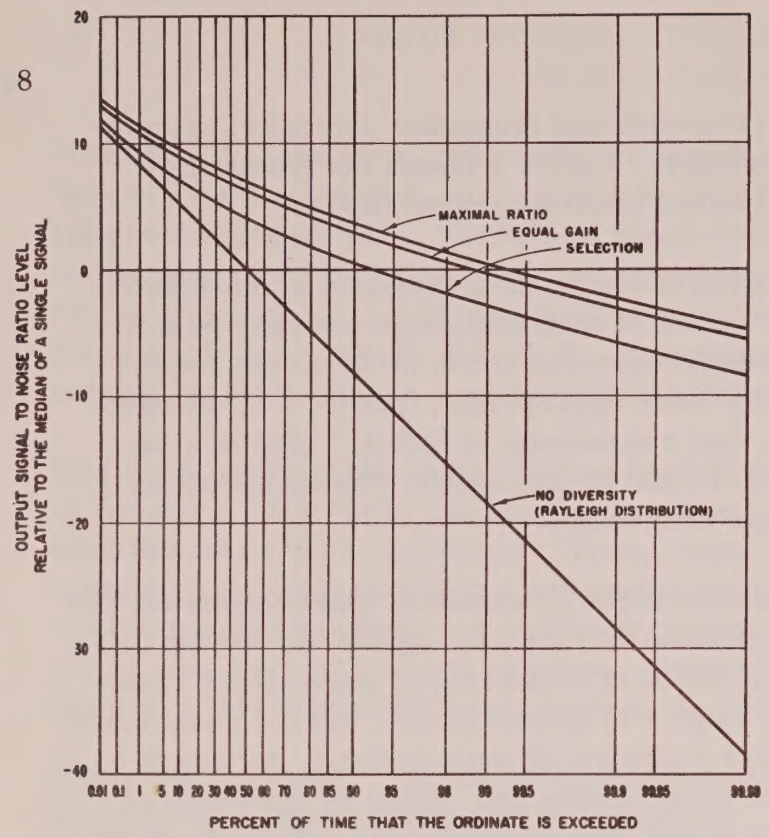
But the subject at hand is space diversity and particularly its application to ionospheric and tropospheric scatter circuits. As these modes of communication are only effective in the VHF-UHF region, and particularly those frequencies above 30 Mc., the requirements of great physical spacing are materially more appropriate; that is, 4 to 10 wavelengths at 20 meters is a minimum of 240 ft. and a maximum of 660 ft. This is a bit impractical, but at 2 meters the distance is 1/10 that at 20 meters. The dimensions are substantially appropriate for amateur-size real estate.

The mechanism of fading on h.f. is very much the same phenomenon that happens on VHF and UHF. It is pretty well conceded that most over-the-horizon signals beyond the diffraction zone on UHF and VHF are mainly the result of scattering of waves from "scatters." The exact nature of these scatters is subject to some dispute, but the results are not. It is clear that most of them come from a multitude of weak returns, as though patches and areas of reflective material were being shaken and varied by the hands of the Almighty. If these energy parts add up in phase, the signal is loud. If out of phase, the signal will fade to nothing at times. A phenomenon that is remarkably similar is star scintillation or "twinkling." The results at the receiving end are very much the same as a very poor h.f. signal with one exception, and that is that there is very little polarization rotation. If a signal starts horizontally polarized, almost all of it ends up at the receiving antenna horizontally polarized.

Signals arriving into a receiving area from a typical scatter signal vary slightly in phase, amplitude and heading. However, if one examines the nature of the phase/amplitude variations along the path "normal" to the direction of arrival up to a distance of 40 wavelengths, a correlation of .5 is still present. Unfortunately the IRE Dictionary of Electronic Terms does not include the term "correlation," but it essentially means the degree of similarity between two signals. A correlation of .5 would mean half of all energy received would be similar in phase and in amplitude and the other half would not. When measurements are made across the path, at 90 degrees to the direction of arrival, a correlation of .5 is measured at only 3.5 wavelengths. This would suggest a curious long, thin shape to the coherency of arriving energy. It does say clearly that an array more than 4 wavelengths across will not yield its full free space gain in scatter circuits.

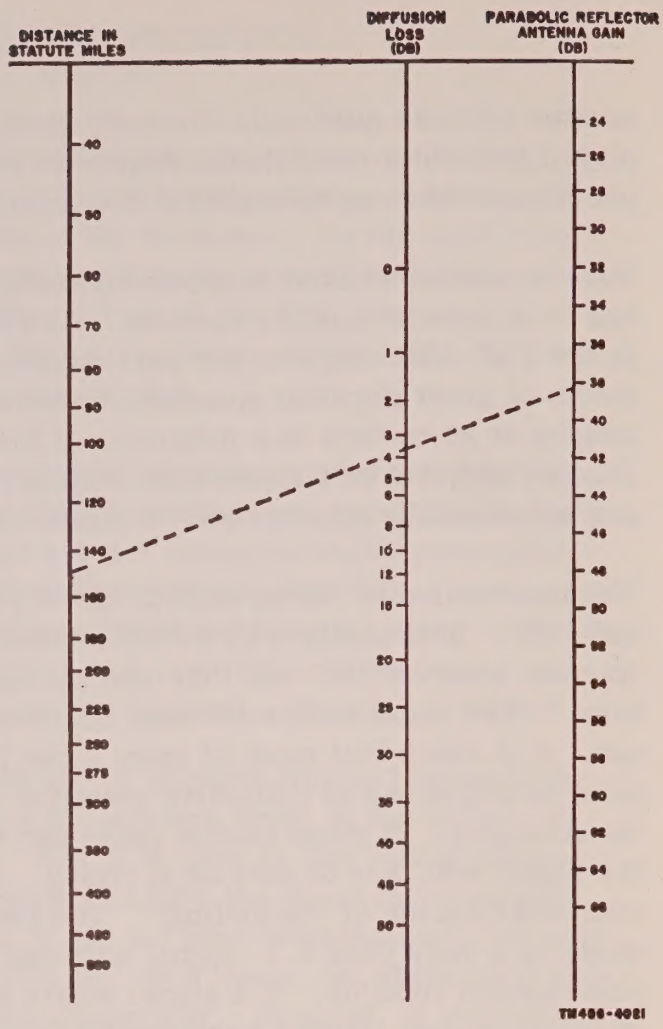
Figure 3 shows the "gain loss" which can be expected at various distances and conditions from this very effect. But this very effect is what makes diversity work. Moving away with a second antenna, you get a different fading pattern.

There has been a great deal of comprehensive data collected regarding the nature of fading signals. See Figure 4. This shows a typical distribution of fading, comparing various types of combining when used with dual diversity, interestingly enough. Note that the upfades are rather limited in amplitude, while the downfades are almost bottomless. Also shown is the improvement attainable from dual diversity. Note that it's good for almost 3 d.b. on an average (that is, 50% of all time) and on poor signal conditions you will lose less than 8.5 d.b. below the average signal for 99% of all time. Three different types of diversity combiners are shown---the maximum ratio, equal gain and selection. The maximum ratio combiner uses the best features of both the equal gain and the selection combiner. The term selection is another name for switching. For amateur purposes I suggest the experimenter start with the swithing type for simplicity's sake. Combiners



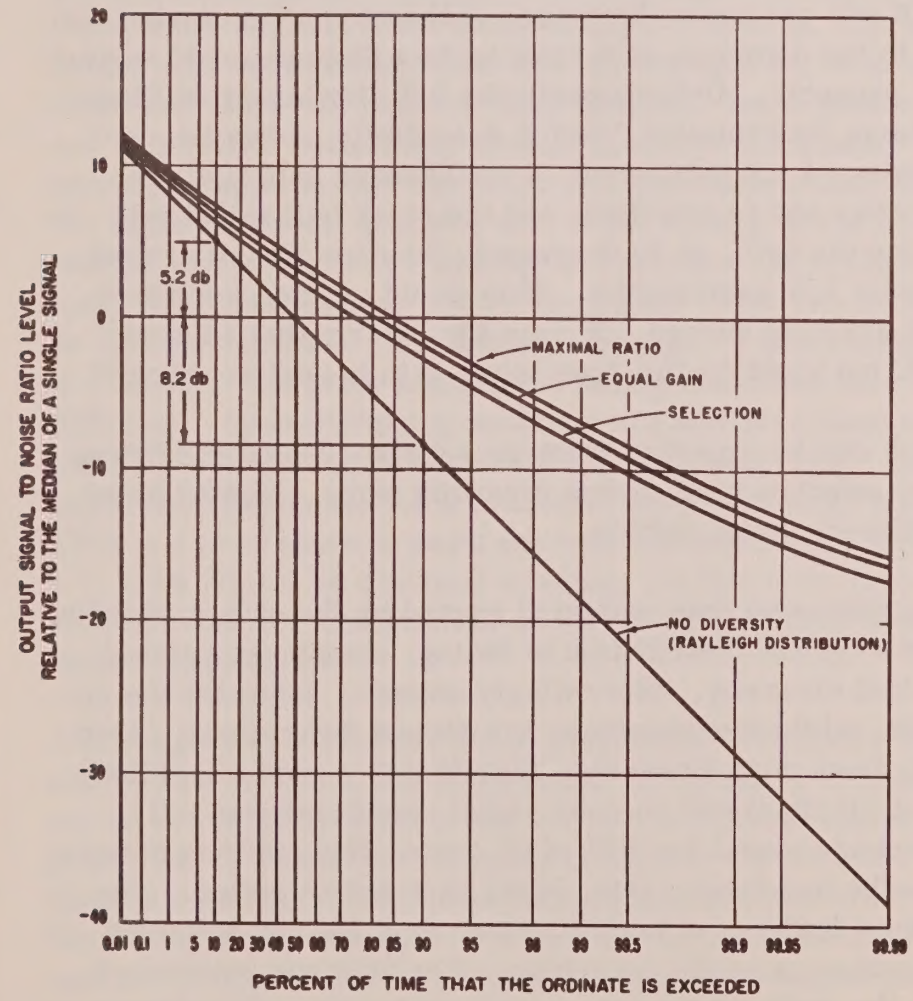
Comparison of the Time Distribution of Three Types of Combiners Using Quadruple Diversity

Figure 2



Nomogram for Estimating Diffusion Loss

Figure 3



Comparison of the Time Distribution of Three Types of Combiners Using Dual Diversity

Figure 4

that will work on C.W. and S.S.B. signals without the human servo or without loss are very complex. The "human servo" diversity selector needs to be no more complex than your listening to the signal on, say, Antenna "B" and turning a transfer switch to Antenna "A" when the signal quality becomes poor, or vice versa.

Now many people have considered the theoretical wonders of diversity and pondered the complex circuits for combiners and other ingenious mechanisms of automation of the diversity combining procedure and, like myself, decided it was too much work and not worth it. However, about three years ago I conducted an extensive series of antenna on-the-air performance checks and the setup was roughly as follows: two different arrays were aligned on a heading roughly 13 degrees West to North and side by side and spaced 12 ft. The antennas under test on the two-meter band were a vast assortment of almost any antennas I could borrow, but mostly were variations of colinear arrays up to 24 elements and Yagis up to 13 elements. A coaxial toggle switch was used to select Antenna A or Antenna B in on-the-air checks. At first, the test antenna and the reference antenna were relocated back and forth to establish that neither the location for Antenna A nor Antenna B had any inherent advantage over the other. The reference antenna was a twin 11-element Cushcraft. Probably the most interesting finding from this family of comparisons was not the fact that some of the best-advertised antennas yielded the poorest results, but the amazing effects of how well space diversity at even so small a distance as 12 ft. actually works. It became necessary to switch back and forth and back and forth to establish a statistical pattern of how the test antenna compared to the reference antenna. What rapidly became significant is that in the vast majority of times, if the signal faded down to an unreadable point on the reference antenna, it would be good, in fact at times very good, on the test antenna and vice versa. The human servo mechanism ending up with the thumb on the switch handle was functioning as a backyard diversity combiner. A more recent variation of this experiment has been the performance of a six element Telrex Yagi roughly 1 ft. above the roof line and 55 ft. below a 13 element four wavelength Yagi. On my Friday night schedules toward the San Francisco Bay area, it has been immensely interesting to observe the number of times that the six-element Yagi substantially on the roof will out-perform the big antenna some 64 ft. in the air. Be assured that if they are compared on a statistical basis, the big antenna runs about 12 d.b. better, both because of more basic gain and greater height than the small antenna. But the diversity effect in hole filling by the low antenna is almost irreplaceable. This is particularly true with a signal such as received from WA6RTM at San Miguel, a distance of 220 miles. Leon's signal usually runs from S-6 to S-9, however repeated fades will take him below intelligibility. Only on rare occasions will the signal have faded down on both antennas at the same time. This, of course, speaks for the desirability of triple diversity, an experiment which I have yet to try but one for which there is great promise. Of course, for optimum performance an optimum antenna should be used for both members of a diversity system. But even a mediocre antenna and a switch can add immensely to the performance of a non-optical system.

Now I would like to refer back to Figure 2. Characteristics like this could come from a system using two different spaced antennas and both horizontal and vertical polarization at the same time. It is a bit complex, but not out of the grasp of an ambitious experimenter. Note that 90% of the time the signal variation would be less than 10 d.b. rather than the 25 d.b. which normally wipes us out at just the wrong time. End.

OPEN BANDS

by Marilyn Wiseman, K8ALO

There have been band openings with very few around to work them (including me). This being the time of year for vacations, high temperatures, humidity, long grass, back-yard barbecues and antenna remodeling, a good many amateurs are staying out of their shacks. Of course there are lots of band openings yet to come so don't give up. If some calls do not appear, I might have received them too late for publication. Loren is trying to set up a publication date so your magazine will reach you earlier in the month than it has in the past. In order to help him achieve this, I'm requesting that all reports be sent to me no later than the 15th of the month. Persons requesting skeds should send their information directly to VHFER and not to me. Looking forward to your reports. Box 103, Petersburg, Ohio 44454.

50 Mc.

July 2-9 W4IMX Nashville wrkd Fla., Texas, Minn, Pa. Conn., Del., Mich., Ohio, N.Y., Winnipeg and heard Ascension Island.

July 20 WA8GBZ (Ohio) wrkd WA4UWW in Fla. at 0850.

July 22 VE6OH at Lethbridge, Alberta wrkd VP7DD in the Bahamas 2600 mi 1026

July 26 WA8GBZ in Ohio wrkd VP7NA in the Bahamas 2600 mi. 1026.

Aug. 1 K1VFX in Stratford, Conn. wrkd K8TCA in Royal Oak, Mich, WA8EJP in Ashtabula, Ohio, K9SRS in Milwaukee and hrd Fla., Ky, Tenn, Ill., Neb. Ark., Mo., Kans., Ind., Bahamas 1840-1940. WA8GBZ in Ohio wrkd WA4NHR in Fla., WA1CZB, WA1EIH, W1ADY, VE1UW 1300 2120.

Aug. 2 WA8GBZ in Ohio wrkd K4TBG in Fla., CO5CN in Cuba 1155-1810.

Aug. 4 WA8GBZ wrkd WA5NHR, WA4IPP (Ala.) 1145-1155.

144 Mc.

July 3 W3RUE Pittsburgh wrkd K4QIF in Salisbury, N.C.

July 12 KØGEY in Iowa wrkd K9UIF (Indiana) 270 mi, K9OYD (Gary, Ind.) 260 mi. and K9RVG Chicago 0039-0150.

July 13 VE3DSU London, Ont. wrkd WØIDY in Cedar Rapids, Iowa, W5JWL (Gurdon, Ark.) .0015-0115. KØGEY (Iowa) wrkd K9RVG (Chicago) 0036. WA8IKN (Ohio) wrkd WA9GWC (Decatur, Ill) 275 mi. 2256.

July 19 KØGEY mobile (Iowa) was heard by W9WCD Dekalb, Ill. 18 watts mobile.

July 21 KØGEY Iowa wrkd K9JAM in Chicago 0030.

July 22 KØGEY wrkd WØPHD in Warren, Minn. 515 mi., K9KYZ Middletown, Ill Hrd WØRWG La Plata, Mo. VE3DSU wrkd W4WNH in Elizabeth, Ky, W4TKH, Lexington, Ky. c.w. 0030-0110.

July 30 W3RUE (Pa.) wrkd K4QIF (N.C.)

Aug. 4 W3RUE wrkd K4MHS in Salisbury, N.C.

Aug. 7 W3RUE wrkd K4QIF (N.C.)

Aug. 8 K9JAM (Chicago) wrkd KØEMO (Hiawatha, Iowa), WØMQS (Cedar Rapids, Iowa) and KØGEY at Calmar, Iowa.

Aug. 10 VE3DSU (Ont.) wrkd W4ZCM (Bondville, Ky) 0030.

Aug. 12 K9JAM (Chicago) wrkd K2GUG (Lancaster, N.Y.), K8AXU (Marietta, Ohio), K9TFC/8 (Bellefountain, Ohio), WA8IDU (Ohio) wrkd K9ZNK, K9RMJ (La Porte, Ind, W4ZCW (Ky.), VE3BVK (St. Thomas, Ont.) hrd W2AZL (Plainfield N.J.) and W9ZIH (Ill.)

Aug. 14 K3GGZ (Pa.) wrkd VE3FJJ (Pickton, Ont.) 300 mi. VE3DSU (Ont.) wrkd W4ZCW (Ky.) 0200. WA8IDU (Ohio) wrkd W4ZCW (Ky.) & hrd VE2CFO.

Aug. 15 K3GGZ (Pa.) wrkd VE3ETO (Mountain, Ont.) 400 mi.

432 Mc.

May 22 W3RUE (Pittsburgh, Pa.) reports first Pittsburgh-Canada QSO.with VE3AIB.

May 24 W3RUE (Pa.) wrkd K2ACQ (Lockport, N.Y.) for first Pittsburgh-NyY. QSO. This is the 9th state on 432 for W3RUE.

June 9 W8FWF (Garden City, Mich.) wrkd W9ZIH (Hickory Hills, Ill) 220 mi, W8PT Benton Harbor, Mich at 135 mi. 2058-2200.

July 3 W3RUE (Pa.) hrd KP4BPZ from 1545-1730. Ted said peaks were S2.

July 5 VE3DSU (London, Ont.) wrkd W9ZIH (Ill.) WA9HUV (Elmhurst, Ill.) hrd Mich. & Ohio. VE3AIB and VE3BQN both wrkd W9ZIH, WA9HUV also. W8FWF (Mich) wrkd VE3DSU (Ont.), WA9HUV 2040-2300.

July 7 W8FWF wrkd VE3AIB (Ont.) 220 miles 0010.

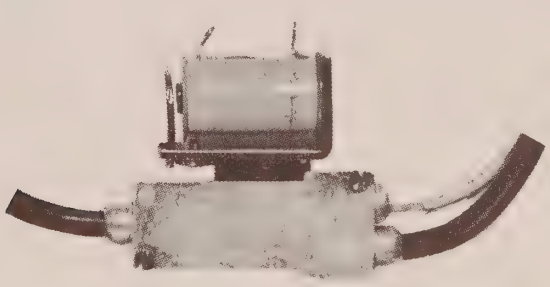
July 11 VE3EMT wrkd W9ZIH, WA9HUV. VE3DSU hrd W9ZIH.

July 12 VE3DSU (Ont) wrkd K2ACQ (Lockport, N.Y.) and hrd W9GAB, W9ZIH, WØRPY, W8FWF (Mich) wrkd WØIDY (Cedar Rapids) 450 mi., WA9HUV 2200 2224. George (W8FWF) runs 20 watts output.

July 24 W3RUE (Pa.) hrd KP4BPZ 0715-1005 S4 peaks. Ted also reports working W8YIO, VE3AIB, VE3BQN, K2ACQ about 2 times a week now.

EFFECTS OF TOO MUCH R.F. ON TRANSISTORS
by K7AAD

We have had only one transistor converter returned for service because of r.f. damage to the transistors. Damage was not at all like we had expected so I thought you might be interested. We found that a signal would still go through the converter and it wasn't too bad. The tuning was off a bit and we re-peaked the r.f. coils. At first we thought the converter had just been diddled with, but on checking the noise figure we found it was way high. It turned out that both r.f. transistors had been damaged--not just the input one. When both were replaced, everything tuned up as it should and made specifications. I have seen and heard of stations using transistor preamps at 432 which did not use shorting type relays. But they were usually very expensive military types. The point I'm trying to make is that just because you can still hear signals on 432 thru a transistor input, don't assume your input transistor isn't damaged.



Coaxial relay for antenna switching of 150 watts maximum R.F. power up to 470 Mc. when inserted in a properly terminated 50-ohm line. For 12 v. mobile equipment, operation over temperature of -30 to +85 degrees centigrade. Contacts, SPDT. VSWR 1.25:1 max. from 0-470 Mc. Crosstalk: 40 db min. 0-470 Mc. Contact springs: silver-plated beryllium copper, positively staked to prevent loosening or turning. Coil: 12 volts d.c. 3 50-ohm cables come out of unit. Ant. cable about 2" long, others about 15" long. No coax fittings on relay. $2 each, postpaid. Sid, K8ZES, 660 Willowcrest, Galion, Ohio 44833

MIDWEST 432 ACTIVITY
by Ken Bell, W9OKB

The summer season has found several stations in Chicagoland running 500 watts or more to large new colinear antennas. W9ZIH is running 1 KW while W9OKB and WA9HUV are at the 500 watt level. SSB has resulted in an increase in phone contacts for WA9HUV and W9OKB with good results into Toledo, Ohio (250 plus miles) and Cedar Rapids, Iowa, over 200 miles from the Chicago area.

Colinear antennas of 64 elements or more seem to be necessary for reliable contacts of 200 miles or more, however, not always required at both ends of a path. W8RQI in Toledo is using 96 elements, 80 watts input with a 4X150 and works reliably into Chicago under normal band conditions. W8YIO in Manchester, Mich. (near Ann Arbor) is working into Chicago regularly especially since an increase in power at his station to the 1/2 k.w. area.

W8PT near Benton Harbor, Mich. works regularly into Chicago and Toledo, being situated between the two cities. Jack reportely is moving to North Carolina and active 432 men will miss his dependable signal from Michigan. Jack reports a better than ever signal-to-noise ratio with his new transistor preamp.

Out in Freeport, Ill. (90 mi. west of Chicago) W9NKT is working WØIDY in Cedar Rapids, Iowa and of course into the Chicago area. WA9NKT also is using a transistor preamp. as is WØIDY.

Up in Milwaukee (90 mi. north of Chicago) W9BTI is still putting out a strong signal with his 4X150 mounted at the antenna. He is keeping skeds with W8PT, W9NKT and most Chicago area stations.

Band openings during August permitted W9GAB and W9ZIH to work into W2 land (400 plus miles). A previous opening allowed WA9HUV to contact a couple of VE3s. WØCTM in Minneapolis is keeping skeds with W9OKB and WA9HUV in an attempt to make the 300 mi. plus path. No luck so far.

Lots of interest in transistor preamps with WØIDY, W9OKB, W9NKT and W8PT using them. Seems like everyone has to experience r.f. burnout of the front end before installing sequential relays or some form of protection. WA9HUV uses an all nuvistor receiving set up with noise figure around 3.5 db. (??? editor) Lack of activity to the south of Chicago is disappointing. Everyone is anxious to see stations on in Missouri or Kentucky. Several hundred watts, a 64 element colinear and a low noise figure preamp should put them into the Chicago or Toledo areas. End.

BACK ISSUES OF 6 UP

We have bundled up 12 back issues of 6 up and offer them to you for $2 postpaid. magazines are free, but you have to help me pay the $46 freight bill for 14 cartons from New Hampshire to Oregon. When the bundles of 12 are gone we will offer smaller bundles or probably any four issues of what we have for a buck--but not yet. Old VHFERS are about impossible to come by. We have some Feb., March, June & July. Some of the early material missed by about a thousand of you will be re-done in future issues, especially constructional articles. We cannot answer your individual inquiries on back issues. The paper load is awful and I'm way behind in the part of the business I eat from. VHFER accounts for over half our mail.

K7RKH will be operating portable from Brianhead peak at 11,315 ft. elevation in Cedar Breaks National Monument, Southwestern Utah during the Sept. 11-12 VHF QSO Party. Bands 50 thru 420 Mc. will be used. 50.0-50.2 and 144.0-144.1 will be used for general tuning during non-schedule periods. Us of 220 or 420 band will be by sked only.

With a few exceptions all schedules will be arranged by radio, using 3810 or 7210 Kc., 75 meters in the evening and early morning, 40 meters in the late morning till sundown. It is expected that the HF bands will be monitored on the hour. It is hoped that those equipped to receive K7RKH will help others and assist as necessary so that all might benefit in this effort. de K7ICW.

The Tektronix A.R.C., K7AUO/7, will again be on 8,000 ft. Paulina Peak near Bend, Oregon during the entire contest. They will have low power (75 watts) on 50 Mc. but kilowatts on 144, 220 and 432. 3810 and 7210 k.c. will be monitored almost continuously for liason purposes. Skeds may also be arranged by letter. Write Gene Single, c/o Tektronix, Box 500, Beaverton, Ore. 97005. Home fone is Area 503 644 0807.

Another Tektronix group will be on Simcoe peak in south central Washington. Call will be K7CCW/7. They will be on 50 thru 432 with moderate power. Good shots in all directions except west, however they think they can work into Seattle. They will attempt to ride piggyback on K7AUO/7 contacts.

SKEDS WANTED

Random tropo and meteor scatter skeds wanted. Also skeds for the Orionids (October), Leonids (November) and Geminids (December) on two meters. Bill Smith, KØCER, 1301 Churchill Ave. Sioux Falls, South Dakota, 57103.

Want meteor scatter skeds. Victor Frank, WB6KAP (W7QDJ), 12450 Skyline Blvd., Woodside, Calif.

I don't know if these fellows want skeds but might be worth a try to some of you. Doug. Allen, K1UGQ reports working W4WNH, K4IXC and W8PT during Perseids. Hrd but did not work K4SJF, W4HHK, K9AAJ and W5RCI. K1UGQ does want skeds for two and operates from Biddeford Pool, Maine (no other address needed) until mid-September, then to home QTH. Has gear on 50, 144 and 220 (abt 150 watts and brand X converters.)

Wanted: 144 Mc. meteor and non-meteor DX skeds. Must know your frequency to within 1/2 kc. Location is ten miles north of Sacramento. Jay O'Brien, W6GDO. 6606 fifth street, Rio Linda, Calif. 95673.

Some other calls that are heard during meteor showers are K5TQP (New Mexico), K7ICW (Nevada), WØEYE (Colorado), WØENC (S. Dakota) and W7LHL (Wash.)

SUGGESTION FOR M.S. ADDICTS: If you have successfully worked meteor scatter, we should have a record here of your equipment and power level. Periodically then we could put all these calls and addresses in very fine print to get people together for skeds in the areas they want. In other words, a directory just like I hope to do for moon bounce. LP

Want tropo skeds on two meters. Have 250 W. A.M. and 500 W. CW. Ant is 15 element at 49 ft. Richard Flaskerud KØGEY RFD #1 Calmar, Iowa.

WEST COAST VHF REPORT
by Al Olcott, K7ICW

K9UIF reports that his is equipped for EME work on 144 Mc. with 88 elements. His 41 states worked on this band prove that not all his DX is due to a fortuitous QTH. If anyone in Nevada, Utah, Ariz., Idaho and points west wants 2 meter sked he is ready, willing and able. He is in Indiana, 40 mi. SE of Chicago.

Glenn L. Smith, WØDQY in St. Louis is interested in 145 Mc. SSB skeds, especially to the west. He has 27 states on this band. Says he will work cross frequency to 144 Mc. from 145.07. His transmitter is 1 KW, ant. is four 8-element Yagis, tiltable, fed with Andrews Heliax. Rcvr is Collins 51S1 with nuvistor converter. You can write Glen at 9658 Lilly Jean Dr., St. Louis or call 314 428-9741.

Fred Fish, K5TQP reports that he has repeated at least 4 times a QSO with K5WXZ in Garland, Texas. This is a distance of 570 miles airline from his QTH in Albuquerque, New Mexico. Freq. is 144 Mc., c.w. That particular path is not know for regular tropo openings.

On Aug. 6 the 2 meter band opened wide between Sacramento and Los Angeles From 9:30 to 10:40 signals between W6GDO and W6NLZ were S-9 on SSB. Nobody else in Los Angeles could be gotten going. Unfortunately W6GDO's 432 gear was temporarily out of service or they would have tried. WA6RLW in Exeter could not hear NLZ during this time though he usually can. Path length for the opening was about 400 miles.

K7ZIR in Aloha, Ore. (near Portland) worked into Vancouver, B.C. on two.

WØENC, Bob Eide, in Rapid City, S. Dakota has been working KØCER in Sioux Falls S.D. at 325 miles on Tues and Fri nites. Bob reports hearing him nearly every sked on 2 meter c.w. but SSB is very poor. Bob has some quantity of RG-17/U coax available for those in need. Write for shipping costs, etc.

WA5HAO at the tip of Louisiana, way out in the Gulf of Mexico, (what a beautiful noise-free QTH) says he has been hearing the Gulf Coast states of Texas, La., Miss., Ala., and Fla. on a pre-war 144 Mc. super-regen. Imagine what he could do with a gud rcvr.

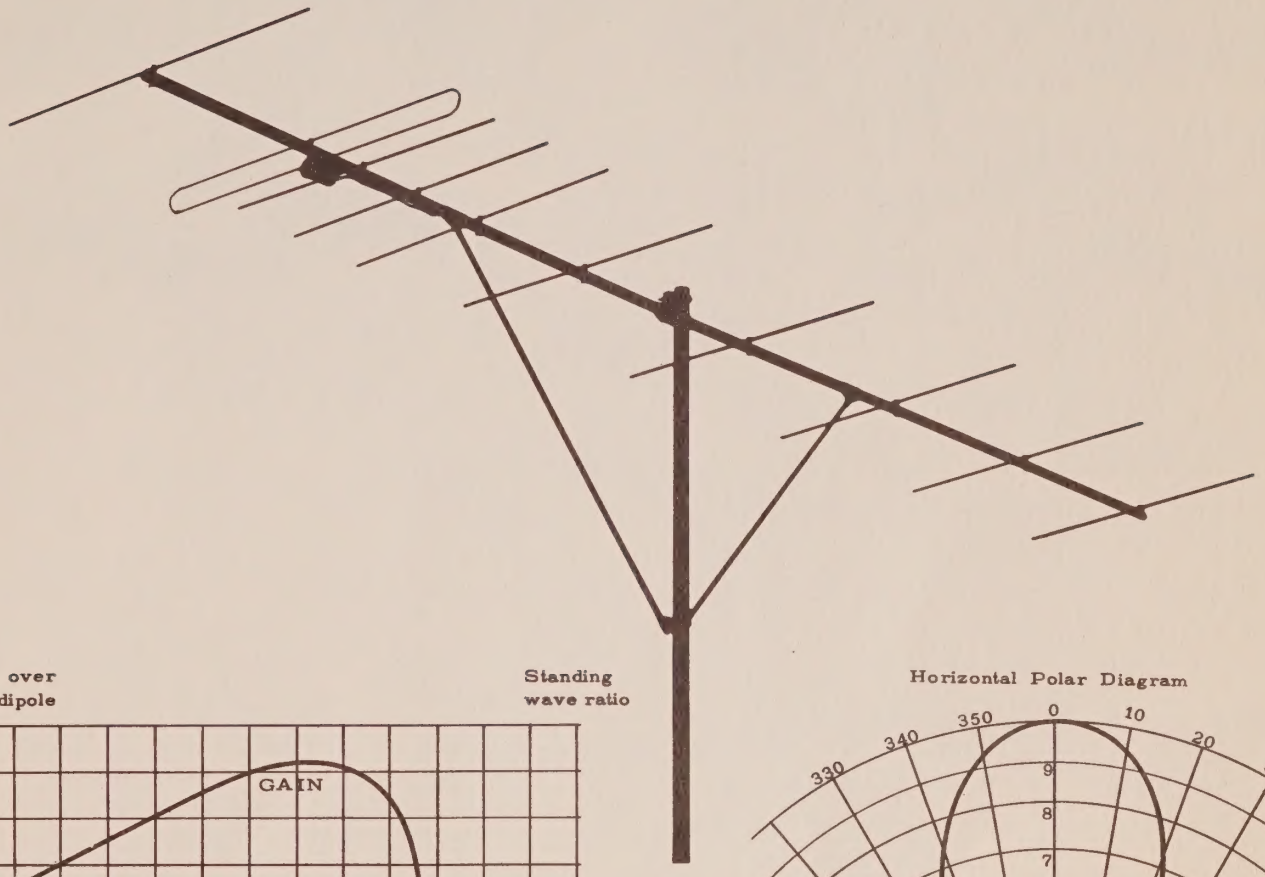
Scotchkote by 3-M, also called Proseal in another brand, is that terrific stuff that you can put on coax connectors with a stick or paint brush. It does not harm the connectors or the coax and seals the joint from the weather. You can see through it and it can be cut off easily with a knife.

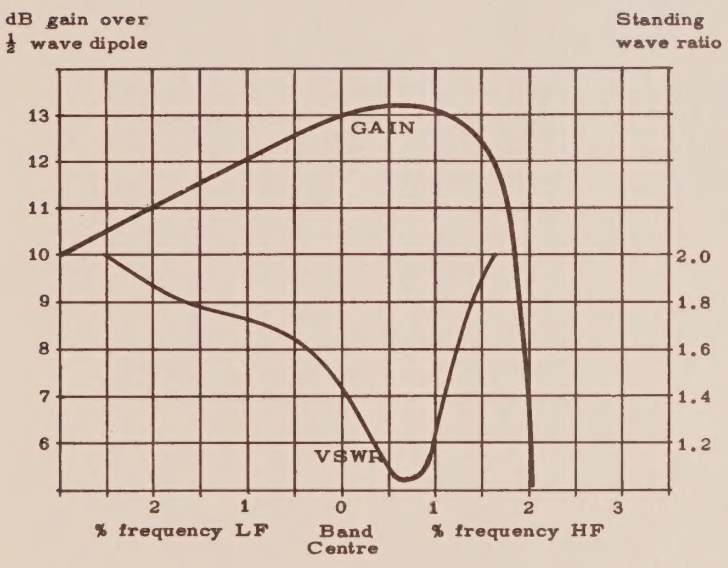
I have reports that J.J. Glass and Candee Electronics in the L.A. area are loaded with dish antennas including a 40-foot monster with polar mount in one case. Prices not known.

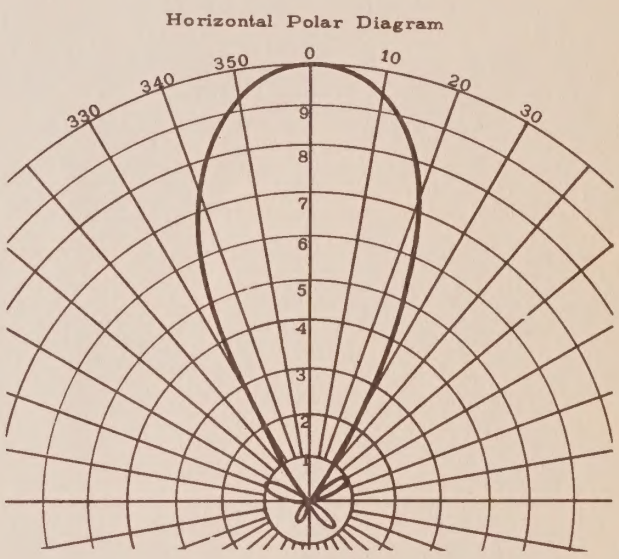
CALL FOR ARTICLES

We are in need of articles, especially constructional type. Don't get the idea that because we manufacture converters we wouldn't accept converter or preamp. articles. We do insist they be put in proper perspective. 432 and 1296 transmitter articles are very much needed and other articles above the idiot level. If you have something in mind, write in and get an opinion here before you go to the work of writing. A line drawing or two or a photograph dresses up an article. How about it?

SKYBEAM





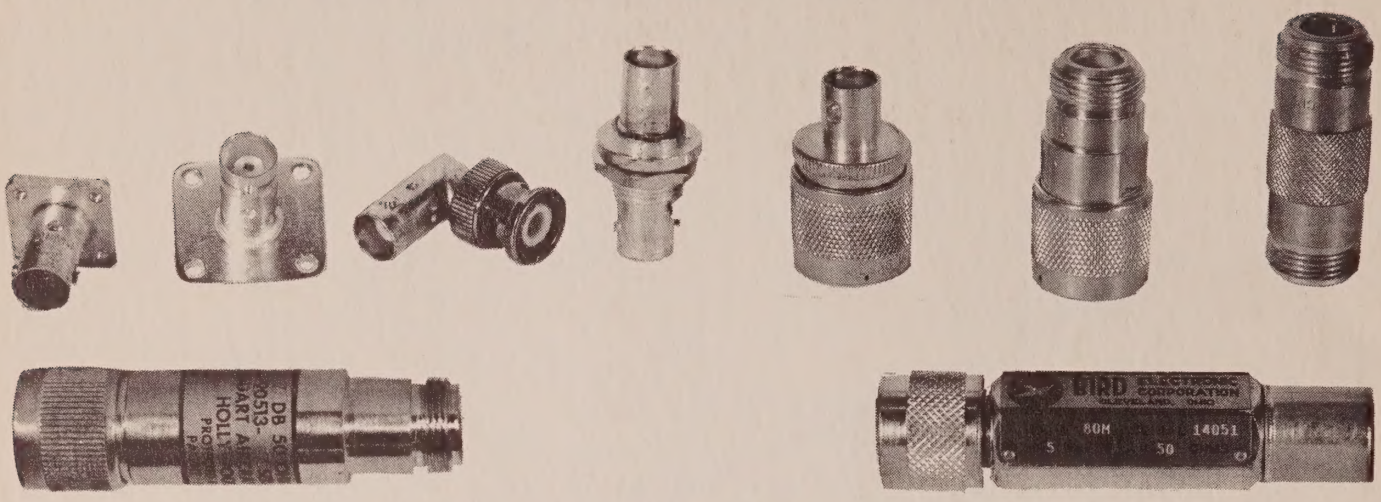


A PROVEN PERFORMER, this two meter SKYBEAM by J Beam Aerials, Ltd. of England. 13 db. gain over a dipole at 146 Mc., 15 db. over an isotropic radiator. Ruggedly built. Boom, elements and support rods of aluminum, 3 brackets of steel (plated). Available for feed with twin lead or coax. See the review in the May VHFER.

Write for literature and prices on this and other J Beams.

Gain, Inc. 27 E. 112th Place Chicago 28, Illinois

SURPLUS



BIRD Model 80-M Coaxial Load Resistor 5 watts continuous duty. VSWR 1.1 max DC to 1,000 Mc. 1.2 max 1,000 to 4,000 Mc. "N" connector. Reg. $25, now $12.50. New.

STODDART coaxial attenuators, used, "N" fittings. 3 db, $6. 1, 8 or 30 db. $5 each. 2 w.

CONNECTORS: BNC small flange, used 50¢. BNC large flange, new, $1.10, BNC elbow, used, $1. BNC thru chassis, used, $1.25. N to BNC adapter, used, $1. UHF male to N female (UG-83 B/U) new, $2. N to N, used, $1. All clean stock, guaranteed. Prices on all the above are postpaid BUT your minimum order must be $5 because of processing costs. You may add small items to your converter order, as the TOTAL will exceed $5.

Published by Parks Electronics Lab.
Route 2, Box 35
Beaverton, Oregon

John G. Troster 6-66
45 Laurel Avenue
Atherton, California

(9)

Return Requested